

# FOREWORD

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California is one of the most seismically active States in the U.S. The statistics generated by seismologists are sobering. Over the coming decades variously sized earthquakes can be expected throughout the State, some with catastrophic damage potential. A sample statistic: there is a *90% probability* that either the San Francisco Bay Area or the Los Angeles basin will suffer a magnitude 7 or larger earthquake by the year 2020.

Probabilities of Large Earthquakes Occurring in Three California Regions			
	San Francisco Bay Area	Los Angeles Basin	
		San Andreas Fault	San Jacinto Fault
Earthquake Magnitude	7.0 or larger	7.5 or larger	6.5 to 7.0
Probability of occurring in next 10 YEARS	33%	20-30%	20%
Probability of occurring in next 30 YEARS	67%	60-70%	50%
Sources: U.S. Geological Survey, 1988. Probabilities of Large Earthquakes Occurring in California on the San Andreas Fault: U.S.G.S. Open-File Report 88-398, 92pp. and U.S. Geological Survey, 1990. Probabilities of Large Earthquakes in the San Francisco Bay Region, California: U.S.G.S. Circular 1053, 51pp.			

Each of the many large earthquakes predicted throughout the State can cause billions of dollars in property damage, loss of human life, injury, and disruptions in transportation, communications and utilities.

As one response to this threat, because unreinforced masonry buildings (URMs) are susceptible to serious damage in a major earthquake, in 1986 the State of California adopted what is commonly referred to as "the URM Law." As discussed later in this *Handbook*, this law requires municipalities and counties within the most seismically active zones in the State to identify and create hazard mitigation programs for the unreinforced masonry buildings in their jurisdiction. A number of earthquake experts are now recommending that such identification and mitigation be applied to other seismically hazardous structures as well, including concrete frame structures

lacking ductile connections, poorly designed tilt-up concrete buildings with inadequate roof-wall connections, and older (pre-1960) homes with inadequate strength in their foundations or cripple walls.

The URM Law stopped short of requiring the owners of URM buildings to upgrade their structures. Many communities, however, have taken the initiative and mandated retrofitting of privately-owned URM and other hazardous buildings. A few jurisdictions have mitigated the URM hazard in their community and more are in the process of doing so. The vast majority of jurisdictions, however, having identified some or all of the hazards, are wondering what they might do to mitigate them. This *Handbook* has been designed with that group in mind.

The Handbook was conceived as part of an effort to find sources of financing for retrofit of privately owned hazardous buildings. The first step in the research process was to survey the 520 cities, towns and counties in California as to the status of their URM retrofit programs, and to gather information on any financial and non-financial incentive programs they may have established. Although more than 35% of those surveyed did respond, very few respondents had implemented any retrofit incentive programs. While the survey did not reveal the pot of gold, we were excited and encouraged by the creativity and resourcefulness of the few jurisdictions which have found ways to leverage or develop financing while promoting retrofitting in their communities. Their efforts are described in this *Handbook*. As you read through the *Handbook*, we urge you to contact the individuals listed so that you may discuss with them their experience and yours.

This *Handbook* introduces the subject of retrofit incentives with **PERSPECTIVE**, the thoughts of Charles Eadie, former Project Manager of the City of Santa Cruz Redevelopment Agency Downtown Recovery Plan. The heart of the *Handbook* lies in the **CASE STUDIES**, which describe steps to promote retrofitting taken by jurisdictions throughout California that may serve as models for others. The case studies were selected from responses to our survey. We met with staff at these municipalities to develop the case studies, which include descriptions of these jurisdictions' programs, as well as discussions of their programs' development, the resources they require, and their effectiveness.

For jurisdictions now trying to develop a system for prioritizing their hazardous buildings, we have included the case study of the City of Sonoma, which adopted a mandatory retrofit ordinance that includes an objective and flexible system of establishing time-lines for retrofitting buildings identified as hazardous. The case study of the City of Palo Alto offers a model for those jurisdictions seeking to develop voluntary ordinances, and includes several non-financial incentives. (Note that we did not include a case study describing the Los Angeles Division 88 ordinance. The ordinance is readily available to those who are interested in a copy. If only because of its size, the City of Los Angeles is unique, and the process by which it developed and

is implementing the ordinance is less likely to serve as a model for the majority of cities. For information about the city's program, refer to *Strengthening Unreinforced Masonry Buildings in Los Angeles* by William Spangle Associates; see: CONTACTS.)

Financing retrofit projects is always a concern. The case studies of the cities of Torrance and Long Beach offer detailed descriptions of the Special Assessment district bond financings which these cities pioneered as a method of providing funds to owners of seismically hazardous properties. The case study of the City of Upland shows how a small city marshalled resources to provide design cost rebates to owners who retrofit their properties. This case study includes excerpts from the complete and very thorough application package designed by the city.

The City of Fullerton case study demonstrates the use of redevelopment agency funds to effect seismic retrofit through targeted no-interest loans. Finally, the case study of the City of West Hollywood illustrates a multi-faceted approach to financial incentives, including adaptation of the city's rent control ordinance to meet the needs of owners and tenants.

There are several jurisdictions in California which have mitigated the hazard in all their identified URM's. While their success is clearly laudable, their stories have not been included in the *Handbook* because their programs were not applicable in the current environment. (The City of Santa Ana, for example, used a form of bond financing which no longer provides any advantage given subsequent changes in Federal tax laws.)

In addition to the case studies, the *Handbook* contains **PROGRAM HIGHLIGHTS**. As compared with the extensive discussion in the case studies, these are brief write-ups of actions taken by local governments to promote seismic retrofitting in their communities. Names and telephone numbers are provided for readers who would like additional information.

The next two chapters of the *Handbook* discuss the tools which jurisdictions can use in developing programs to promote retrofitting. **USING ZONING AS AN INCENTIVE TO RETROFIT** by Michael Dyett, AICP, discusses ways in which zoning can be used to promote seismic upgrading. The chapter entitled **LOCAL GOVERNMENT FINANCING OPTIONS** outlines potential sources of funding.

A description of the URM Law and of recent legislation comprises **CALIFORNIA STATE SEISMIC LEGISLATION**, which includes a discussion of the direction in which the State of California is headed as it continues to address the issue. **LIABILITY IMPLICATIONS AND CONSIDERATIONS** discusses the question of liability in the event of an earthquake. Finally, we have also included for easy reference a list of the **CONTACTS** whose names appear elsewhere in the *Handbook*.

In researching this *Handbook* we have learned a few basic lessons which we would like to share with our readers:

**\*Developing an approach to seismic retrofitting is essential, difficult and time-consuming.** It requires the dedicated attention over a long period of time of at least one staff member, and the guidance and complete support of the elected body of the jurisdiction. Understanding the nature and scope of the problem is an important first step.

**\*Successful programs require the active participation of the community.** The jurisdiction must work closely with property owners, tenants, the business community, historic preservationists, and all other interested parties to ensure that the program developed is perceived to be fair, reasonable, and workable. Education, before, during and after program development, is critical to its success.

**\*There is no such thing as a model program.** Each jurisdiction is unique in its circumstances and its resources, and each must develop its own approach.

We wish you good luck and hope this *Handbook* will be helpful as you search for solutions to the problem of retrofitting privately-owned seismically hazardous structures.